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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/938,075	08/23/2001	Mohammad Eslamy	9818-055-999	9873

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PENNIE AND EDMONDS  
1155 AVENUE OF THE AMERICAS  
NEW YORK, NY 100362711

EXAMINER

NGUYEN, JOSEPH H

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 03/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/938,075

Applicant(s)

ESLAMY, MOHAMMAD

Examiner

Joseph Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 16-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

***Election/Restriction***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-15, drawn to a semiconductor chip carrier, classified in class 257, subclass 738 and wherein:
- II. Claims 16-19, drawn to a method of making a semiconductor chip carrier, classified in class 438, subclass +1.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case unpatentability of the Group I invention would not necessarily imply unpatentability of the Group II invention, since the product of the Group I invention could be made by another and materially different process from those of the Group II invention. For example, as an alternative in claim 16, attaching a supplemental substrate to the second side of the metal heat sink plate prior to attaching a primary substrate to the first side of the metal heat sink plate.

Because these inventions are distinct for the reasons given above, the inventions have acquired a separate status in the art because of their recognized divergent subject matter as shown by their different classification, the search required for Group II is not required for Group I, and separate examination would be required, restriction for examination purposes as indicated is proper.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

During a telephone conversation with Francis Morris on March 6, 2002 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-15. Affirmation of this election must be made by applicant in replying to this Office action. Claims 16-19 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily

published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-2, 4-7, 9, 11-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Shishido et al.

Regarding claim 1, Shishido et al discloses on figure 2 a semiconductor chip carrier comprising a primary substrate 12; a metal heat sink plate 30b having a first side and opposing second side where said primary substrate is attached to said first side; and a supplemental substrate 30a attached to said metal heat sink plate on said second side.

Regarding claim 2, Shishido et al discloses that the supplemental substrate 30a is constructed from a material having substantially similar coefficient of thermal expansion as said primary substrate 12 (col. 3, lines 57-67).

Regarding claim 4, Shishido et al discloses the primary substrate is constructed from a material selected from one of FR4 (col. 3, lines 34-36).

Regarding claim 5, Shishido et al discloses on figure 2 the primary substrate 12 is a ball grid array chip carrier.

Regarding claim 6, Shishido et al discloses on figure 2 the metal heat sink plate 30b is a metal selected from one of Cu, Al and alloys (col. 3, lines 37-40).

Regarding claim 7, Shishido et al discloses on figure 2 the supplemental substrate has a Cu-Ni finish layer (col. 3, lines 37-40).

Regarding claim 9, Shishido et al discloses on figure 2 a semiconductor chip carrier comprising a primary substrate 12; a metal heat sink plate 30b having a first side

and an opposing second side where said primary substrate is attached to said first side; and a supplemental substrate 30a being attached to said second side of said metal heat sink plate, wherein said supplemental is constructed from a material having a substantially similar coefficient of thermal expansion as said primary substrate (col. 3, lines 57-67).

Regarding claim 11, Shishido et al discloses that the primary substrate 12 is constructed from a material selected from one of FR4 (col. 3, lines 34-36).

Regarding claim 12, Shishido et al discloses the chip carrier is a ball grid array chip carrier.

Regarding claim 13, Shishido et al discloses the metal heat sink plate 30b consists of one of Cu, Al and alloys (col. 3, lines 37-40).

Regarding claim 14, Shishido et al discloses the supplemental substrate 30a has a Cu-Ni finish layer (col. 3, lines 37-40).

Claims 1, 5 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Johnson et al.

Regarding claim 1, Johnson et al discloses on figure 6 a semiconductor chip carrier comprising a primary substrate 12; a metal heat sink plate 28 having a first side and an opposing second side where said primary substrate is attached to said first side; and a supplemental substrate 22 attached to said metal heat sink plate on said second side.

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Regarding claim 5, Johnson et al discloses on figure 6 the primary substrate 12 is a ball grid array chip carrier.

Regarding claim 8, Johnson et al discloses the supplemental substrate 22 has a cavity exposing a portion of said metal heat sink plate 28.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Shishido et al as applied to claims 1 and 9 above.

Regarding claims 3 and 10, Shishido et al discloses on figure 2 substantially all the structure set forth in the claimed invention except the supplemental substrate being constructed from a same material as the primary substrate. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Shishido et al by having the supplemental substrate being constructed from a same material as the primary substrate for the purpose of reducing the manufacturing cost of the semiconductor device package, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as matter of obvious design choice. In re Leshin, 125 USPQ 416.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shishido et al as applied to claim 9 above, and further in view of Johnson et al.

Regarding claim 15, Shishido et al discloses on figure 2 substantially all the structure set forth in the claimed invention except the supplemental substrate having a cavity exposing a portion of the metal heat sink plate. However, Johnson et al discloses on figure 6 the supplemental substrate 22 having a cavity exposing a portion of the metal heat sink plate 28. In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Shishido et al by having the supplemental substrate having a cavity exposing a portion of the metal heat sink plate for the purpose of reducing the manufacturing cost of a semiconductor device package.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent 6163458 to Li discloses a heat spreader for a ball grid array package.

US Patent 5888884 to Wojnarowski discloses a semiconductor device package.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (703) 308-1269. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for



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the organization where this application or proceeding is assigned is (703) 308-7382 for regular communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JN  
March 8, 2002

A handwritten signature in black ink, appearing to read 'Eddie Lee', is positioned above the printed name and title.

EDDIE LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800